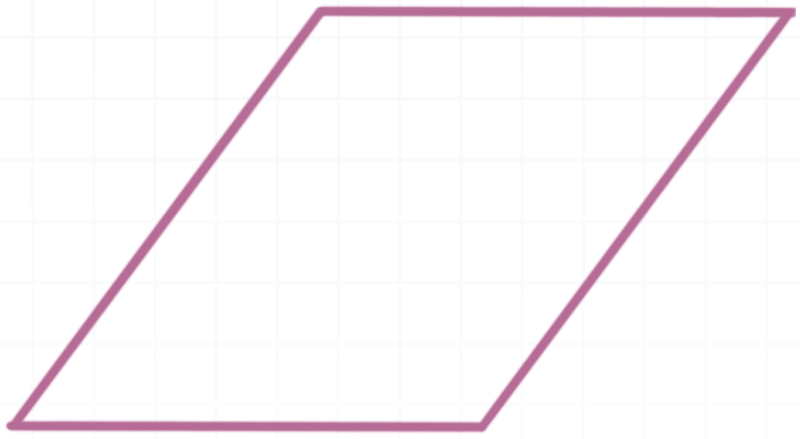
Area of a parallelogram

In this lesson we'll look at how to find the area of a parallelogram. A parallelogram is a quadrilateral with two pairs of opposite parallel sides.



Area of a parallelogram

The area of a parallelogram is found by multiplying the base by the height, so

$$A = bh$$

The height of a parallelogram needs to be drawn in and is perpendicular to its base.

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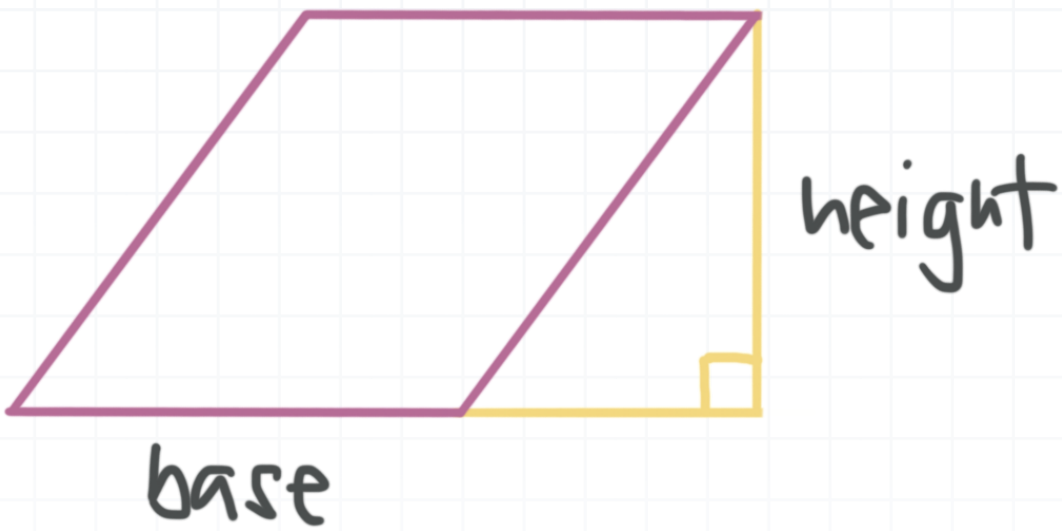
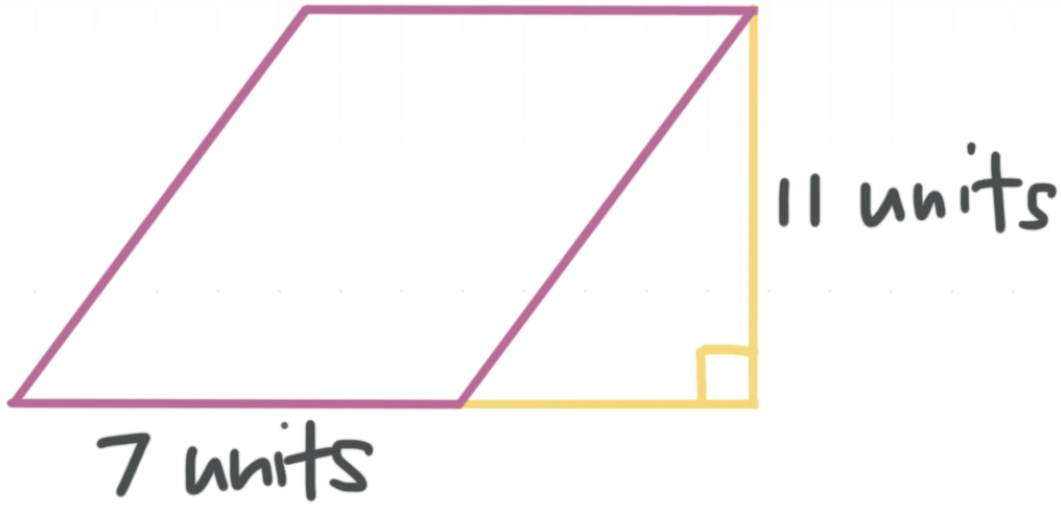


The units for the area of a parallelogram are always units^2. Let's start by working through an example.

Example

What is the area of the parallelogram?



In this parallelogram, the base has a length of 7 units, and a height of 11 units, so the area is

$$A = 7(11)$$

$$A = 77 \text{ units}^2$$

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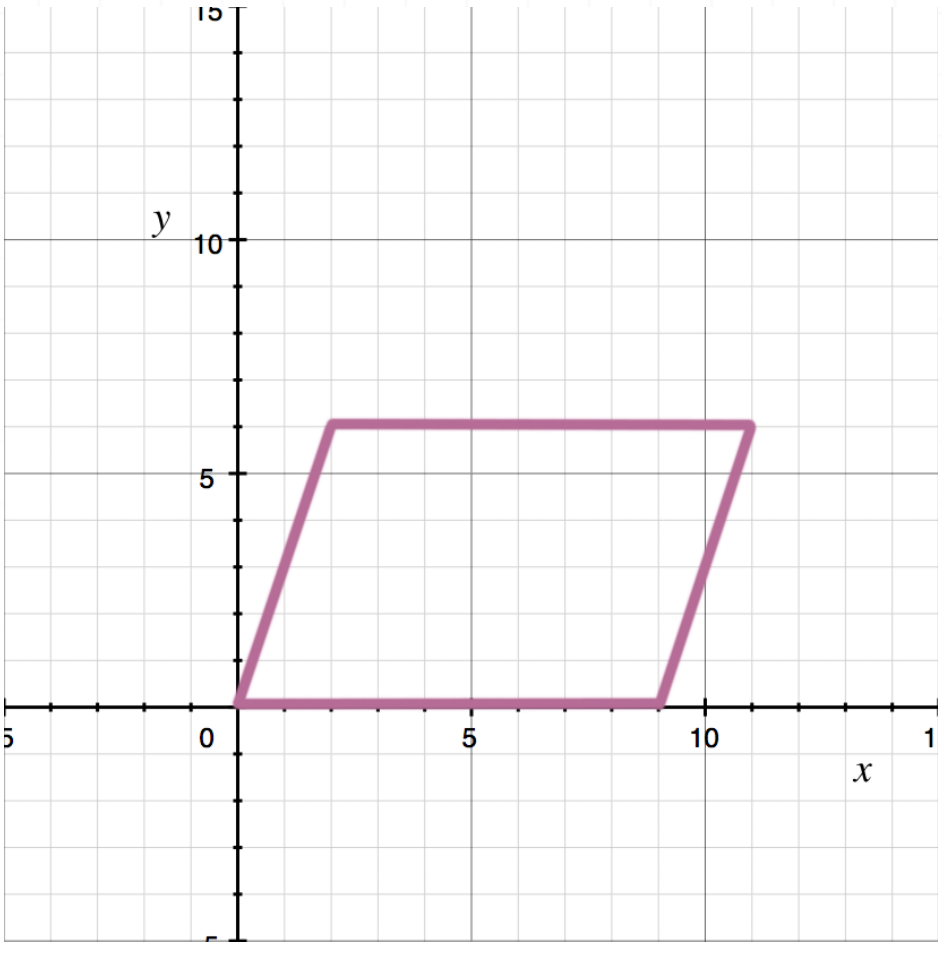
Let's do another example.

Example

What is the area of the parallelogram in square units?



Count the squares to find the dimensions of the parallelogram.

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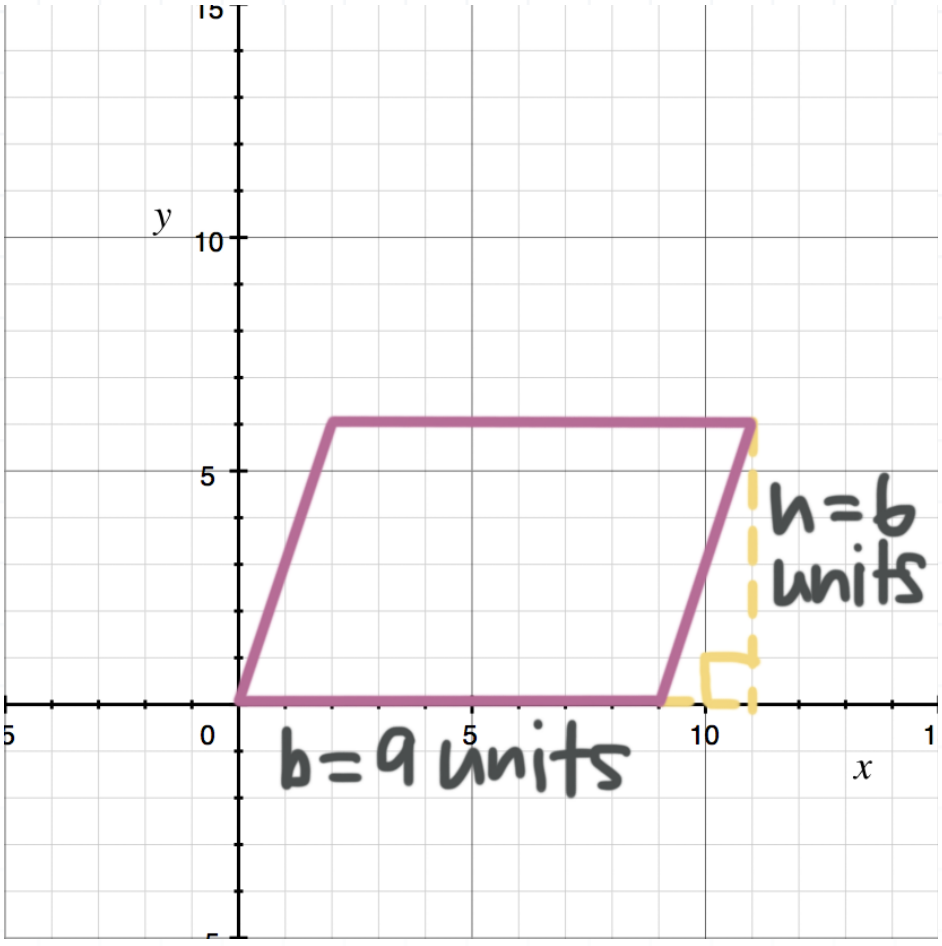

Now we can use the area formula.

$$A = bh$$

$$A = 9 \text{ units} \cdot 6 \text{ units}$$

$$A = 54 \text{ units}^2$$

Let's do one with a few more steps.

Example

What is the area of the parallelogram in square units?

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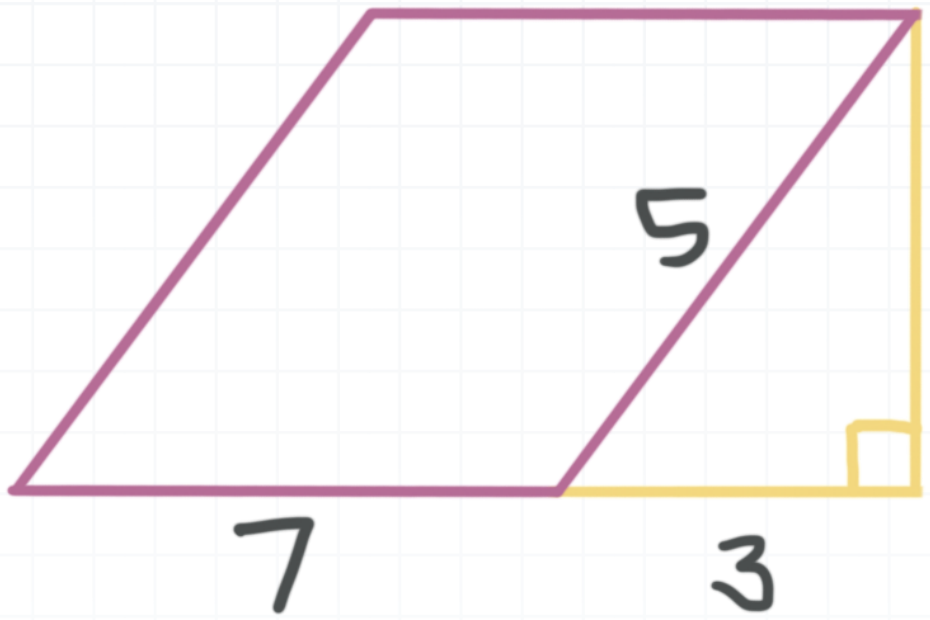
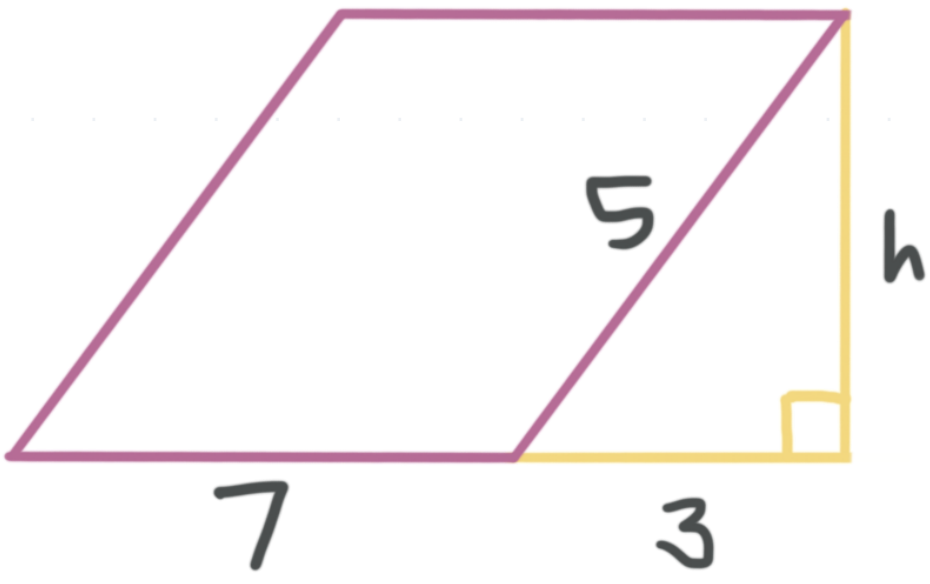


The area of a parallelogram is $A = bh$. We know the base of the parallelogram is 7 units, but we need to find the height. We can see that the yellow lines and the slanted side of the parallelogram form a right triangle, so we can use the Pythagorean theorem to solve for the height.

Let's call the height h.



Then we can plug everything we have into the Pythagorean theorem to find h.

$$3^2 + h^2 = 5^2$$

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$$9 + h^2 = 25$$

$$h^2 = 16$$

$$h = \pm\sqrt{16}$$

$$h = \pm 4$$

Height can't take on a negative value, so $h = 4$. Now we can say that the area of the parallelogram is

$$A = 7 \cdot 4$$

$$A = 28 \text{ units}^2$$

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